

(19) 日本国特許庁 (J P)

(12) 公開特許公報 (A)

(11) 特許出願公開番号

特開2001-8736

(P2001-8736A)

(43) 公開日 平成13年1月16日 (2001.1.16)

(51) Int.Cl.

A 4 6 B 15/00

識別記号

F I

A 4 6 B 15/00

テーム(参考)

M 3 B 2 0 2

審査請求 未請求 請求項の数 3 O L (全 4 頁)

(21) 出願番号 特願平11-182158

(22) 出願日 平成11年6月28日 (1999.6.28)

(71) 出願人 598163817

阿原 一良

栃木県日光市本町四番十二号

(72) 発明者 阿原 一良

栃木県日光市本町4番12号

(74) 代理人 100095739

弁理士 平山 俊夫

Fターム(参考) 3B202 AA06 AB13 AB18 BA02 BB07

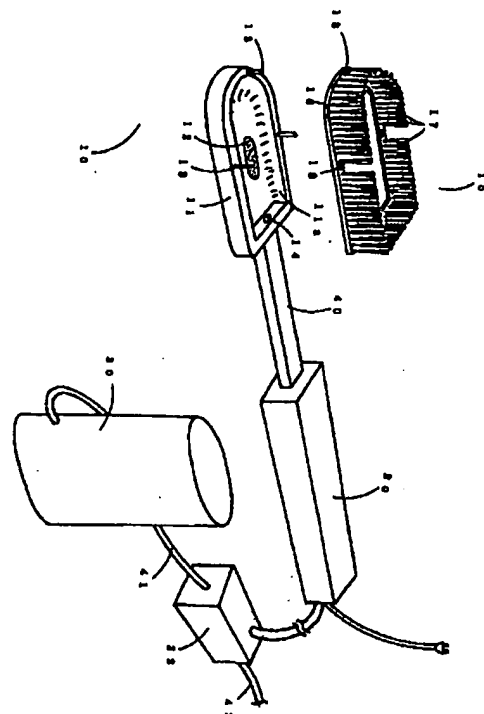
EG20 FA09 GA28

(54) 【発明の名称】 超音波歯ブラシ

(57) 【要約】

【課題】超音波による洗浄作用を真に有効にする排水機能を備えた歯ブラシを開発する。

【解決手段】本発明超音波歯ブラシは、ブラシを植設した頭部10と、該頭部を支持する柄部20と、一定水量を蓄えた給水タンク部30とから成り、該頭部10には、凹部11aに臨ませて圧電振動子12を配設すると共に一部に給水口と排水口とを配した頭体11を形成し、該頭体11の周縁に沿って着脱自在なブラシ体15を配設し、該柄部20の一部には、上記圧電振動子に高周波を送る電気回路21を配設し、該給水タンク部30には、少なくとも一回の歯みがきに必要な水を蓄える容量の給水タンク31を配すると共に、給水及び/又は排水を司るポンプ22を備えて成る。



## 【特許請求の範囲】

【請求項1】 ブラシを植設した頭部と、該頭部を支持する柄部と、一定水量を蓄えた給水タンク部とから成り、

該頭部には、凹部に臨ませて圧電振動子を配設すると共に一部に給水口と排水口とを配した頭体を形成し、該頭部の周縁に沿って着脱自在なブラシ体を配設し、該柄部の一部には、上記圧電振動子に高周波を送る電気回路を配設し、

該給水タンク部には、少なくとも一回の歯みがきに必要な水を蓄える容量の給水タンクを配すると共に、給水及び／又は排水を司るポンプを備えて成ることを特徴とする超音波歯ブラシ。

【請求項2】 ポンプが、負圧側と加圧側とに繋いで一つのポンプで給水と排水を行うようにした請求項1記載の超音波歯ブラシ。

【請求項3】 給水タンク部に、排水タンクを併設させた請求項1、2項いずれか記載の超音波歯ブラシ。

## 【発明の詳細な説明】

## 【0001】

【発明の属する技術分野】本発明は、超音波洗浄歯ブラシに関し、更に詳細には、超音波の洗浄作用を活用すると共に、その際に水の供給と排出を円滑にして、洗浄効果を高める歯ブラシに関する。

## 【0002】

【従来の技術】超音波洗浄を用いた歯ブラシに対しては、従来下記の如き技術が提案されている。

【0003】特開昭56-121511号公報には、発生装置により交流信号を接触装置に供給し、接触装置から圧電部材に交番磁界を伝達し、交流信号の周波数による機械的振動が柄部材にブラシ部材に誘起されるようにし、交流信号の周波数による機械的振動が細長い柄部材とブラシ部材に誘起されるようにすることにより、一般的には比較的に近接できない歯の回りの部分の良好な洗浄効果が得られるようにする超音波歯ブラシ装置が示されている。

【0004】又、特開昭63-109807号公報には、ブラシが突設された頭体及び頭体に延設された柄体からなり、その頭体から超音波を発射させることにより、歯垢の除去効果及び歯周組織のマッサージ効果を増大させ、また歯磨き剤の歯垢除去作用の相乗的向上を図る歯ブラシ型口腔衛生器が示されている。

【0005】更に、特開平1-238806号公報には、超音波振動子と連結固定された連結装置に、連結装置を用いて導体と連結板を連結し、導体の先端に、振動板と毛から構成されたブラシをロー着し、水槽の水を送水ポンプを用いて送水し、散水口から散水しながら超音波発信器を用いてナイロン製の毛を振動させる超音波歯ブラシが示されている。

## 【0006】

【発明が解決しようとする課題】これらはいずれも、超音波による洗浄作用を歯ブラシに活用しようとするものであり、歯ブラシのブラッシング効果を一層高めようとする発想に基づいている。ところで、超音波による洗浄には超音波を伝達すべき水が口腔内に十分に満たされていなければならない。例えば、上記特開平1-238806号公報にあっても、超音波歯ブラシに送水ポンプで水を供給する技術が提案されている。しかし、これらには供給された水を排出する手段が皆無であり、その結果、例えば洗面ボールの上に顔を出し、口を開けたままで水を供給しつつブラッシングを続け、その水を口から溢れ出すままに洗面ボールに流すことになってしまう。従って、前屈姿勢が窮屈であると同時に、毎日の歯みがきには面倒極まりなく、更に衣服を濡らす恐れがある。又、口腔内の水が過剰又は過小になり易く、超音波の洗浄効果が真に有効には発揮されないという欠点があり、本発明はこれら欠点を解消しようとするものである。

## 【0007】

【課題を解決するための手段】本発明超音波歯ブラシは、ブラシを植設した頭部と、該頭部を支持する柄部と、一定水量を蓄えた給水タンク部とから成る。該頭部には、凹部に臨ませて圧電振動子を配設すると共に一部に給水口と排水口とを配した頭体を形成し、該頭部の周縁に沿って着脱自在なブラシ体を配設する。該柄部の一部には、上記圧電振動子に高周波を送る電気回路と給水及び／又は排水を司るポンプを配設し、該給水タンクは、少なくとも一回の歯みがきに必要な水を蓄える容量で、上記頭部の給水口に連通する連通管を配して成る。該ポンプは、負圧側と加圧側とに繋いで、一つのポンプで給水と排水を行うようにするのが望ましい。

## 【0008】

【発明の実施の形態】本発明歯ブラシは、ブラシを植設した頭部10と、該頭部を支持する柄部20と、一定水量を貯留可能な給水タンク部30とから成る。

【0009】該頭部10は、頭体11とブラシ体15とから成り、該頭体11には、ブラシ体15と着脱させる為、ブラシ体15に沿った大きさ、形状とし、その中央部に一定量の水を溜めることが可能な凹部11aを穿設し、その底面に臨ませて超音波を発振可能な圧電振動子12を配設する。該圧電振動子12は、チタン酸バリウム等の強誘電体で、該強誘電体に高周波電圧を印加して超音波振動を発生させるものである。そして、上述の如く該圧電振動子12の上には凹部11aを形成すると共に、その凹部を囲繞した辺縁の一部に水を供給する給水口13を形成する一方で、基端部側には該凹部11aの底辺に臨んで水の排出を司る排出口14を形成する。

【0010】ブラシ体15は、上記頭体11の凹部11aの辺縁部と合致する形状で基辺16を形成し、そこにブラシ束17、17・・・を植設し、該ブラシ束17、17の間に頭体11の辺縁と結合する為の孔18を穿設す

る。該ブラシ体15は、一定期間使用したら、使い捨てにするもので、プラスチック等の比較的安価に量産できるものが良い。

【0011】次に、柄部20には、上記頭部10に臨ませた圧電振動子12へ超音波を発生させる為の高周波電圧を惹起する電気回路21を形成する。該電気回路21は、例えば、二つのトランジスタをSEPP結合させて交互にスイッチング動作させて振動子の共振周波数で発信するものを挙げることができるが、これに限らず超音波を発生する回路ならいずれでも良い。

【0012】次に給水タンク部30は、頭体11の給水口13から水を噴出させて口腔内に水を供給する為の給水タンク31を有し、少なくとも一回の歯みがきを行うに必要な水量を貯留可能な容量とする。更に、図3に示す如く、必要に応じて給水タンク31に隣接させて、排水されてきた水を一時的に貯留させるための排水タンク33を併設することができる。そして、該給水タンク31及び排水タンク33には、給水及び排水の起動力となるポンプを連結させる。該ポンプの態様は幾つか挙げられ、図1及び図2の如く、該ポンプの加圧側を給水側に負圧側を排出側にそれぞれ連結して一台のポンプ22で給水と排水の双方を兼ねる形態とするのが望ましい。しかし、ポンプの形態の違いにより、二つのポンプを使用する場合には、図3の如く水を貯留させた給水タンク31側に給水ポンプ32を配設し、排水タンク33内に排水ポンプ34を配設しても良い。

【0013】尚、頭部10と柄部20との間には、連結桿40を配し、該連結桿40内には、給水管41と排水管42とを内蔵させる。

【0014】次に、本発明実施態様の作用を説明する。まず、本発明歯ブラシを使用するには、頭体11にブラシ体15を結合させ、且つ、給水タンク部30の給水タンク31内に少なくとも一回の洗浄に必要な量の水を溜めて置く。そして、ブラシ体15に洗剤を付けて口腔内に差し入れ、同時に超音波発振回路21及びポンプ22のスイッチをONにする。すると、ポンプ22によって、給水タンク31から水が給水管41等を伝って、頭部10の給水口13から水が供給され、噴出した水が口腔内を満たす。尚、ポンプに給水ポンプ32（及び排水ポンプ34）を設けた場合には、当然に該ポンプのスイッチを入力する。

【0015】同時に、上記電気回路21の入力で、圧電振動子12から超音波が発生し、その振動がブラシ体15を微細に振動させる。その結果、歯に接触したブラシ束17と歯との間に微振動による摩擦作用が惹起され、歯垢、食べ滓等が除去される。同時に、超音波は水の中でキャビテーションを惹起させ、歯に付着した汚れを吸引、剥離し、又、洗浄液の攪乱、乳化作用等によって、上記摩擦作用による洗浄に加え、一層の洗浄効果が促進される。

【0016】次いで、上記歯の洗浄作用が促されるに従って、口腔内には多量の水が供給され、それが一定量を超えると、口腔内から溢れ出し、そのまま垂れ流される。従って従来は、そこで水の供給を停止するか、或いは、洗面台等に屈み込んだ姿勢を採り、口を開けたままで、溢れ出す水を洗面台に流下させるしかなかった。しかし、本発明歯ブラシは、該頭部10の凹部11aの基端部に排水口14を形成してあるので、ポンプからの吸引力で排水口付近に溜まった水が吸引され、排水管42を経て、洗面台等に自動的に排水される。

【0017】従って、口腔内に水が溢れることがなく、水の供給と排出のバランスが図られ、口腔内は適度な水が供給されることになる。よって、給水及びそれに伴う超音波振動による洗浄を続けることができ、且つ、その際に洗面台等に向かって前屈みになる姿勢を採る必要はなく、背筋を伸ばしたままの自然の姿勢を保つことができる。

【0018】更に、排水タンク33を設ければ、洗面台等の排水設備がなくとも排水を一時的に蓄えることができ、この結果、ベットに伏した病人や、介護老人、幼児等に好適なものとなる。

【0019】

【発明の効果】以上の如き本発明によれば、超音波による優れた洗浄作用が期待でき、歯垢の除去や、歯周のマッサージ効果が得られる。その際、従来は口を開けて洗面台等に流下させていたから、過剰か過小で適度な量の水がなく、超音波を当ててもあまり有効でなかったが、しかし、本発明では、水の供給と排水との均衡が図られるから口腔内に適度な量の水が存在し、真に有効な超音波の効果が期待できる。又、ブラシ体は交換容易なので、使い捨てが可能で、消耗部だけを取り替えれば良く経済的であり、更に、歯磨き姿勢が、前屈みになる必要がなく、背を伸ばした自然な姿勢でいられるから、快適となる等の数々の利点を奏する。

【図面の簡単な説明】

【図1】本発明ブラシの分解斜視図。

【図2】本発明ブラシの即断面図。

【図3】本発明ブラシに排水タンクを設けた態様のタンクの側断面図。

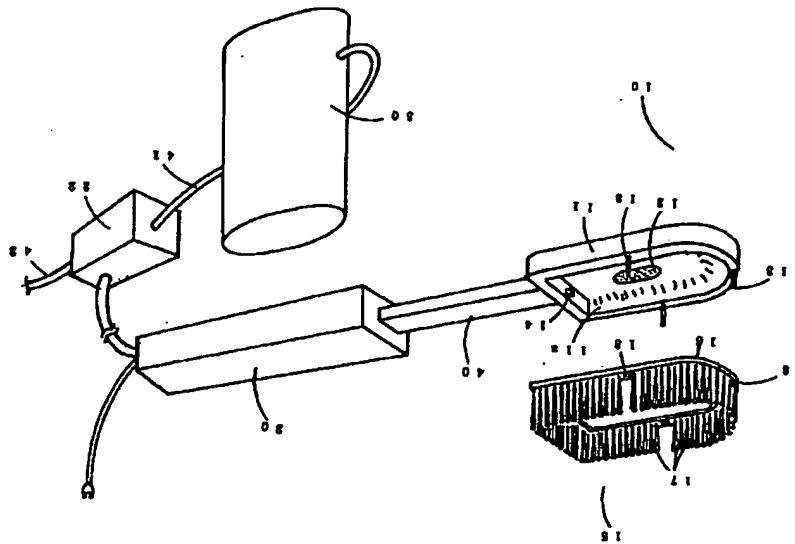
【符号の説明】

- 10 頭部
- 11 頭体
- 11a 凹部
- 12 圧電振動子
- 13 給水口
- 14 排水口
- 15 ブラシ体
- 20 柄部
- 21 電気回路
- 22 ポンプ

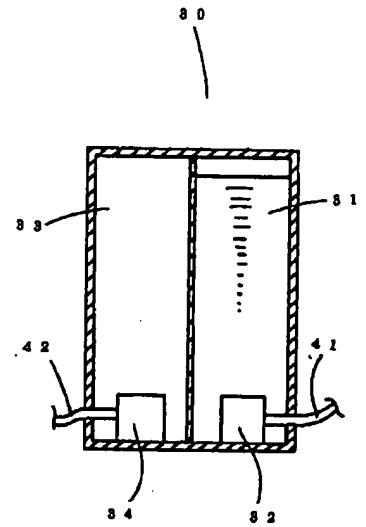
30 給水タンク部  
31 給水タンク  
32 給水ポンプ

33 排水タンク  
34 排水ポンプ

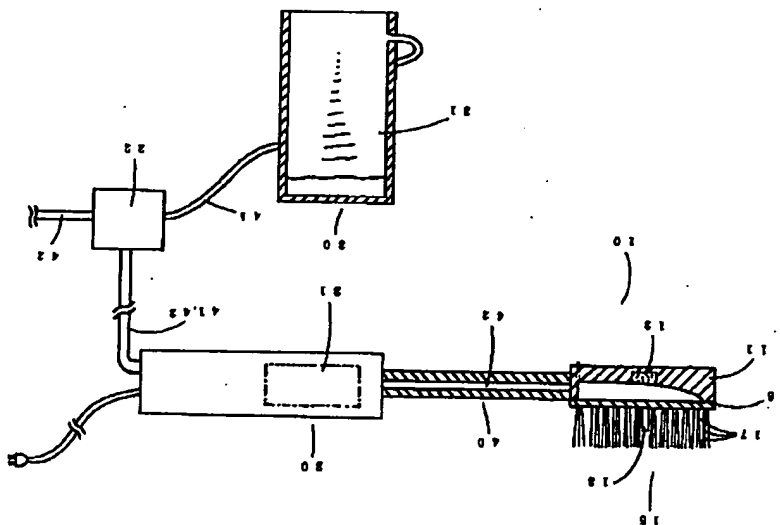
【図1】



【図3】



【図2】



PAT-NO: JP02001008736A  
DOCUMENT-IDENTIFIER: JP 2001008736 A  
TITLE: ULTRASONIC TOOTH BRUSH  
PUBN-DATE: January 16, 2001

INVENTOR-INFORMATION:

NAME	COUNTRY
AHARA, KAZUYOSHI	N/A

ASSIGNEE-INFORMATION:

NAME	COUNTRY
AHARA KAZUYOSHI	N/A

APPL-NO: JP11182158

APPL-DATE: June 28, 1999

INT-CL (IPC): A46B015/00

ABSTRACT:

PROBLEM TO BE SOLVED: To develop a tooth brush having a draining function for making a washing effect by ultrasonic wave truly effective.

SOLUTION: This ultrasonic tooth brush consists of a head part 10 implanted with brush, a handle part 20 for supporting the head part and a water feed tank part 30 in which a specified volume of water is stored. The head part 10 forms a head body 11 disposed with a piezoelectric vibrator 12 facing a recessed part 11a and partly disposed with a water feed port and drain port. A freely attachable and detachable brush body 15 is disposed along the peripheral edge of the head body 11. An electric circuit for feeding high frequencies to the piezoelectric vibrator 12 is disposed in part of the handle part 20. A water

feed tank of the capacity to store the water necessary for at least one time of tooth brushing is disposed in the water feed tank part 30. The water feed tank part has a pump 22 taking charge of water feeding and/or water draining.

COPYRIGHT: (C)2001,JPO

JAPANESE

[JP,2001-008736,A]

---

CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE  
INVENTION TECHNICAL PROBLEM MEANS DESCRIPTION OF DRAWINGS DRAWINGS

---

[Translation done.]

DETAILED DESCRIPTION

---

## [Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention makes supply and discharge of water smooth in that case, and relates to the gear-tooth brush which heightens a cleaning effect while it utilizes the detergency of a supersonic wave for a detail further about a ultrasonic-cleaning gear-tooth brush.

[0002]

[Description of the Prior Art] To the gear-tooth brush using ultrasonic cleaning, the technique like the following is proposed conventionally.

[0003] generally the ultrasonic gear-tooth brush equipment with which a cleaning effect with the surrounding good part of the gear tooth which is comparatively alike and cannot approach is acquired is shown by by supplying an AC signal to contactor with a generator at JP,56-121511,A, transmitting alternating field to a piezo-electric member from contactor, the induction of the mechanical oscillation by the frequency of an AC signal being made to be carried out to a brush member at pedicel material, and the induction of the mechanical oscillation by the frequency of an AC signal being made to be carried out to long and slender pedicel material and a brush member.

[0004] Moreover, the gear-tooth brush mold oral hygiene machine which the removal effectiveness of a dental plaque and the massage effectiveness of the periodontium are increased, and aims at improvement in multiplication-of a dental plaque removal operation of a tooth paste is shown by by becoming JP,63-109807,A from \*\*\*\* installed in \*\*\*\* and \*\*\*\* on which the brush protruded, and firing a supersonic wave from the \*\*\*\*.

[0005] Furthermore, a coupling device is used and a connecting plate is connected with a conductor, low arrival of a diaphragm and the brush hair conceptacle constituted is carried out at the tip of a conductor, and water is supplied to it using a conveying pump in the water of a tank, and the ultrasonic gear-tooth brush which vibrates the hair made of nylon using an ultrasonic transmitter is shown in the coupling device by which connection immobilization was carried out with the ultrasonic vibrator at JP,1-238806,A, sprinkling from water spray opening.

[0006]

[Problem(s) to be Solved by the Invention] Each of these tends to utilize the detergency by the supersonic wave for a gear-tooth brush, and is based on the way of thinking which is going to heighten the brushing effectiveness of a gear-tooth brush further. By the way, even if the water which should transmit a supersonic wave to washing by the supersonic wave must fully be filled in the oral cavity, for example, it is in above-mentioned JP,1-238806,A, the technique which supplies water to an ultrasonic gear-tooth brush with a conveying pump is proposed. However, it will pass on a washing-its-face ball as brushing is continued and opening is overflowed for the water, supplying water there being no means to discharge the water supplied to these, consequently showing up on for example, a washing-its-face ball, and opening opening. Therefore, while a procurvation posture is stiff, there is no troublesome pole ball in daily dentifrice, and there is a possibility of wetting clothes further. Moreover, the water in the oral cavity tends to become [ too little / superfluously or ], there is a fault that the cleaning effect of a supersonic wave is not demonstrated very effectively, and this invention tends to cancel these faults.

[0007]

[Means for Solving the Problem] this invention supersonic-wave gear-tooth brush is as fixed as the head which implanted the brush, and the pedicel which supports this head -- it consists of the feed water tank section which stored amount of water. While making this head face a crevice and arranging a piezoelectric transducer in it, \*\*\*\* which allotted water supply opening and an exhaust port to the part is formed in it, and the brush object which can be detached and attached freely is arranged in it along the periphery of this head. The pump which manages the electrical circuit, water supply, and/or wastewater which send a RF to the above-mentioned piezoelectric transducer is arranged in this a part of pedicel, When there are few these feed water tanks, they are the capacity which stores water required for one dentifrice, arrange the communicating tube which is open for free passage to water supply opening of



the above-mentioned head, and change. As for this pump, it is desirable to tie to a negative pressure and pressurization side and for one pump to be made to perform water supply and wastewater.

[0008]

[Embodiment of the Invention] this invention gear-tooth brush consists of the head 10 which implanted the brush, the pedicel 20 which supports this head, and the fixed feed water tank section 30 which can store amount of water.

[0009] This head 10 consists of \*\*\*\* 11 and the brush object 15, in order to make this \*\*\*\* 11 detach and attach with the brush object 15, consider as the magnitude and the configuration where the brush object 15 was met, drill in it crevice 11a which can fill the water of a constant rate in the center section, it is made to attend the base, and oscillation \*\*\*\* arranges a piezoelectric transducer 12 in it for a supersonic wave. These piezoelectric transducers 12 are ferroelectrics, such as barium titanate, impress high-frequency voltage to this ferroelectric, and generate supersonic vibration. And while forming crevice 11a on this piezoelectric transducer 12 like \*\*\*\* and forming the water supply opening 13 which supplies water to a part of verge which surrounded the crevice, the exhaust port 14 which attends a end face section side at the base of this crevice 11a, and manages discharge of water is formed.

[0010] the configuration in which the brush object 15 agrees with the side edge of crevice 11a of above-mentioned \*\*\*\* 11 -- \*\*\*\* 16 -- forming -- there -- the brush bundles 17 and 17 .. is implanted and the hole 18 for combining with the verge of \*\*\*\* 11 among these brush bundles 17 and 17 is drilled. When this brush object 15 carries out fixed period use, it is made throwing away and that of things which can be mass-produced comparatively cheaply, such as plastics, is good.

[0011] Next, the electrical circuit 21 where the high-frequency voltage for generating a supersonic wave to the piezoelectric transducer 12 made to attend the above-mentioned head 10 is caused is formed in a pedicel 20. Although this electrical circuit 21 can mention what is made to carry out SEPP association, is made to carry out switching operation of the two transistors by turns, and sends them with the resonance frequency of vibrator, if it is the circuit which generates not only this but a supersonic wave, any are sufficient as it.

[0012] Next, the feed water tank section 30 has the feed water tank 31 for making water blow off from the water supply opening 13 of \*\*\*\* 11, and supplying water in the oral cavity, and is taken as the capacity which can store amount of water required to perform at least one dentifrice. Furthermore, as shown in drawing 3, a feed water tank 31 can be made to be able to adjoin if needed, and the waste water tank 33 for making the drained water store temporarily can be put side by side. And the pump used as the impetus of water supply and wastewater is made to connect with this feed water tank 31 and a waste water tank 33. As for some modes of this pump, it is desirable to consider as the gestalt which is mentioned, connects the pressurization side of this pump with the negative pressure side discharge-side to a water supply side like drawing 1 and drawing 2, respectively, and serves as the both sides of water supply and wastewater by one set of a pump 22. However, by the difference in the gestalt of a pump, when using two pumps, like drawing 3, a feed pump 32 may be arranged in the feed water tank 31 side in which water was made to store, and a drainage pump 34 may be arranged in a waste water tank 33.

[0013] In addition, a connecting rod 40 is arranged between a head 10 and a pedicel 20, and a feed pipe 41 and a drain pipe 42 are made to build in in this connecting rod 40.

[0014] Next, an operation of this invention embodiment is explained. First, in order to use this invention gear-tooth brush, the brush object 15 is combined with \*\*\*\* 11, and the water of a complement is collected and placed into the feed water tank 31 of the feed water tank section 30 at at least one washing. And a detergent is attached to the brush object 15, it inserts into the oral cavity, and the switch of the ultrasonic oscillator circuit 21 and a pump 22 is turned ON at coincidence. Then, water is transmitted to feed pipe 41 grade from a feed water tank 31, water is supplied by the pump 22 from the water supply opening 13 of a head 10, and the water which blew off fills the inside of the oral cavity with it. In addition, when a feed pump 32 (and drainage pump 34) is formed in a pump, naturally the switch of this pump is inputted.

[0015] In the input of the above-mentioned electrical circuit 21, in coincidence, a supersonic wave occurs from a piezoelectric transducer 12, and the vibration vibrates the brush object 15 minutely to it.

consequently, the friction operation by fine vibration causes between the brush bundles 17 and gear teeth in contact with a gear tooth -- having -- a dental plaque -- it eats and slag etc. is removed. In coincidence, a supersonic wave makes cavitation cause in water, attracts the dirt adhering to a gear tooth, and exfoliates, and, in addition to washing by the above-mentioned friction operation, much more cleaning effect is promoted by the disturbance of a penetrant remover, emulsification operation, etc. at it.

[0016] Subsequently, if a lot of water is supplied in the oral cavity and it exceeds a constant rate as it is urged to the detergency of the above-mentioned gear tooth, it will overflow out of the oral cavity and will hang down as it is. Therefore, the washstand had to be made to flow down the water to overflow, taking the posture which suspends supply of water there or leaned over [ the washstand etc. ], and opening opening conventionally. However, since this invention gear-tooth brush has formed the exhaust port 14 in the end face section of crevice 11a of this head 10, the water which collected near the exhaust port in the suction force from a pump is attracted, and it is automatically drained by the washstand etc. through a drain pipe 42.

[0017] Therefore, water will not overflow in the oral cavity, supply of water and balance of discharge will be achieved, and moderate water will be supplied in the oral cavity. Therefore, it is not necessary to take the posture which can continue water supply and washing by the supersonic vibration accompanying it, and slouches toward a washstand etc. in that case, and a posture with natural having straightened the back can be maintained.

[0018] Furthermore, if a waste water tank 33 is formed, it will become a suitable thing for the sick person who could store wastewater temporarily even if there were no facilities for drainage, such as a washstand, consequently lay down on the bed, a care old man, a small child, etc.

[0019]

[Effect of the Invention] According to this invention like \*\*\*\*, the outstanding detergency by the supersonic wave can be expected and removal of a dental plaque and the massage effectiveness of \*\*\*\* are acquired. Although it was not so effective even if there is no water of an excess or a too little and moderate amount and it applied the supersonic wave since opening was opened and the washstand etc. was made to flow down conventionally in that case, in this invention, since balance with supply of water and wastewater is achieved, a moderate quantity of water exists in the oral cavity, and the effectiveness of a very effective supersonic wave can be expected. moreover, a brush object -- exchange -- it can throw away, it is [ what is necessary ] to exchange only the section [ exhausting ] and is economical, and since it is easy, further, a toothbrushing posture does not need to slouch, and since it is with the natural posture which lengthened the back, many advantages, such as becoming comfortable, are done so.

---

[Translation done.]

\* NOTICES \*

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

---

MEANS

---

[Means for Solving the Problem] this invention supersonic-wave gear-tooth brush is as fixed as the head which implanted the brush, and the pedicel which supports this head -- it consists of the feed water tank section which stored amount of water. While making this head face a crevice and arranging a piezoelectric transducer in it, \*\*\*\* which allotted water supply opening and an exhaust port to the part is formed in it, and the brush object which can be detached and attached freely is arranged in it along the periphery of this head. The pump which manages the electrical circuit, water supply, and/or wastewater which send a RF to the above-mentioned piezoelectric transducer is arranged in this a part of pedicel, When there are few these feed water tanks, they are the capacity which stores water required for one dentifrice, arrange the communicating tube which is open for free passage to water supply opening of the above-mentioned head, and change. As for this pump, it is desirable to tie to a negative pressure and pressurization side and for one pump to be made to perform water supply and wastewater.

[0008]

[Embodiment of the Invention] this invention gear-tooth brush consists of the head 10 which implanted the brush, the pedicel 20 which supports this head, and the fixed feed water tank section 30 which can store amount of water.

[0009] This head 10 consists of \*\*\*\* 11 and the brush object 15, in order to make this \*\*\*\* 11 detach and attach with the brush object 15, consider as the magnitude and the configuration where the brush object 15 was met, drill in it crevice 11a which can fill the water of a constant rate in the center section, it is made to attend the base, and oscillation \*\*\*\* arranges a piezoelectric transducer 12 in it for a supersonic wave. These piezoelectric transducers 12 are ferroelectrics, such as barium titanate, impress high-frequency voltage to this ferroelectric, and generate supersonic vibration. And while forming crevice 11a on this piezoelectric transducer 12 like \*\*\*\* and forming the water supply opening 13 which supplies water to a part of verge which surrounded the crevice, the exhaust port 14 which attends a end face section side at the base of this crevice 11a, and manages discharge of water is formed.

[0010] the configuration in which the brush object 15 agrees with the side edge of crevice 11a of above-mentioned \*\*\*\* 11 -- \*\*\*\* 16 -- forming -- there -- the brush bundles 17 and 17 .. is implanted and the hole 18 for combining with the verge of \*\*\*\* 11 among these brush bundles 17 and 17 is drilled. When this brush object 15 carries out fixed period use, it is made throwing away and that of things which can be mass-produced comparatively cheaply, such as plastics, is good.

[0011] Next, the electrical circuit 21 where the high-frequency voltage for generating a supersonic wave to the piezoelectric transducer 12 made to attend the above-mentioned head 10 is caused is formed in a pedicel 20. Although this electrical circuit 21 can mention what is made to carry out SEPP association, is made to carry out switching operation of the two transistors by turns, and sends them with the resonance frequency of vibrator, if it is the circuit which generates not only this but a supersonic wave, any are sufficient as it.

[0012] Next, the feed water tank section 30 has the feed water tank 31 for making water blow off from the water supply opening 13 of \*\*\*\* 11, and supplying water in the oral cavity, and is taken as the capacity which can store amount of water required to perform at least one dentifrice. Furthermore, as

shown in drawing 3 , a feed water tank 31 can be made to be able to adjoin if needed, and the waste water tank 33 for making the drained water store temporarily can be put side by side. And the pump used as the impetus of water supply and wastewater is made to connect with this feed water tank 31 and a waste water tank 33. As for some modes of this pump, it is desirable to consider as the gestalt which is mentioned, connects the pressurization side of this pump with the negative pressure side discharge-side to a water supply side like drawing 1 and drawing 2 , respectively, and serves as the both sides of water supply and wastewater by one set of a pump 22. However, by the difference in the gestalt of a pump, when using two pumps, like drawing 3 , a feed pump 32 may be arranged in the feed water tank 31 side in which water was made to store, and a drainage pump 34 may be arranged in a waste water tank 33. [0013] In addition, a connecting rod 40 is arranged between a head 10 and a pedicel 20, and a feed pipe 41 and a drain pipe 42 are made to build in in this connecting rod 40.

[0014] Next, an operation of this invention embodiment is explained. First, in order to use this invention gear-tooth brush, the brush object 15 is combined with \*\*\*\* 11, and the water of a complement is collected and placed into the feed water tank 31 of the feed water tank section 30 at at least one washing. And a detergent is attached to the brush object 15, it inserts into the oral cavity, and the switch of the ultrasonic oscillator circuit 21 and a pump 22 is turned ON at coincidence. Then, water is transmitted to feed pipe 41 grade from a feed water tank 31, water is supplied by the pump 22 from the water supply opening 13 of a head 10, and the water which blew off fills the inside of the oral cavity with it. In addition, when a feed pump 32 (and drainage pump 34) is formed in a pump, naturally the switch of this pump is inputted.

[0015] In the input of the above-mentioned electrical circuit 21, in coincidence, a supersonic wave occurs from a piezoelectric transducer 12, and the vibration vibrates the brush object 15 minutely to it. consequently, the friction operation by fine vibration causes between the brush bundles 17 and gear teeth in contact with a gear tooth -- having -- a dental plaque -- it eats and slag etc. is removed. In coincidence, a supersonic wave makes cavitation cause in water, attracts the dirt adhering to a gear tooth, and exfoliates, and, in addition to washing by the above-mentioned friction operation, much more cleaning effect is promoted by the disturbance of a penetrant remover, emulsification operation, etc. at it.

[0016] Subsequently, if a lot of water is supplied in the oral cavity and it exceeds a constant rate as it is urged to the detergency of the above-mentioned gear tooth, it will overflow out of the oral cavity and will hang down as it is. Therefore, the washstand had to be made to flow down the water to overflow, taking the posture which suspends supply of water there or leaned over [ the washstand etc. ], and opening opening conventionally. However, since this invention gear-tooth brush has formed the exhaust port 14 in the end face section of crevice 11a of this head 10, the water which collected near the exhaust port in the suction force from a pump is attracted, and it is automatically drained by the washstand etc. through a drain pipe 42.

[0017] Therefore, water will not overflow in the oral cavity, supply of water and balance of discharge will be achieved, and moderate water will be supplied in the oral cavity. Therefore, it is not necessary to take the posture which can continue water supply and washing by the supersonic vibration accompanying it, and slouches toward a washstand etc. in that case, and a posture with natural having straightened the back can be maintained.

[0018] Furthermore, if a waste water tank 33 is formed, it will become a suitable thing for the sick person who could store wastewater temporarily even if there were no facilities for drainage, such as a washstand, consequently lay down on the bed, a care old man, a small child, etc.

---

[Translation done.]

\* NOTICES \*

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

---

CLAIMS

---

[Claim(s)]

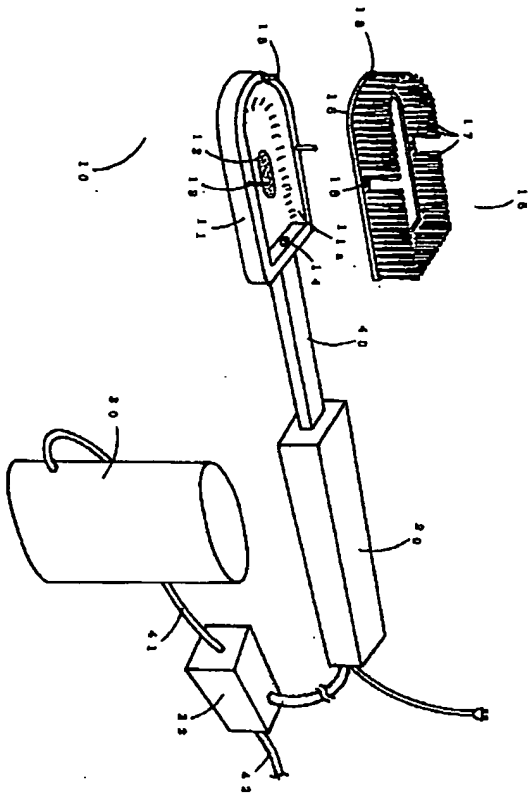
[Claim 1] It consists of the feed water tank section which stored amount of water. as fixed as the head which implanted the brush, and the pedicel which supports this head -- in this head While making a crevice attend and arranging a piezoelectric transducer, \*\*\*\* which allotted water supply opening and an exhaust port to the part is formed, and the brush object which can be detached and attached freely is arranged along the periphery of this head. To this a part of pedicel The ultrasonic gear-tooth brush which arranges the electrical circuit which sends a RF to the above-mentioned piezoelectric transducer, and is characterized by having the pump which manages water supply and/or wastewater, and changing at it while arranging on it the feed water tank of capacity in which water required for one dentifrice is stored, if few in this feed water tank section.

[Claim 2] The ultrasonic gear-tooth brush according to claim 1 to which a pump ties to a negative pressure and pressurization side, and was made to perform water supply and wastewater with one pump.

[Claim 3] claim 1 which made the waste water tank put side by side in the feed water tank section, or dyadic -- the ultrasonic gear-tooth brush of a publication.

---

[Translation done.]

Drawing selection **Representative drawing** 

[Translation done.]